ENVIRONMENTAL ASSESSMENT OF HUNTING ON LOST TRAIL NATIONAL WILDLIFE REFUGE

United States Fish & Wildlife Service
National Bison Range Complex

October, 2001

Cover Sheet

Proposed Action:	Allow hunting on Lost Trail National Wildlife Refuge
Type of Statement:	Environmental Assessment
Lead Agency:	U.S. Fish & Wildlife Service
Cooperators:	Montana Department of Fish, Wildlife & Parks Montana Department of Natural Resources Conservation Confederated Salish & Kootenai Tribes
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Acronyms used in this document:
CFR - Code of Federal Regulations
CSKT - Confederated Salish and Kootenai Tribes
DNRC - Montana Department of Natural Resources and Conservation
EA - Environmental Assessment
EMU - MFWP Elk Management Unit
ESA - Endangered Species Act
FWS - U.S. Fish and Wildlife Service
HD - Montana Department of Fish Wildlife and Parks, Hunting District
MFWP - Montana Department of Fish Wildlife and Parks
MPC - Montana Power Company
NEPA - National Environmental Policy Act
NRCS - U.S. Department of Agriculture, Natural Resources Conservation Service
NWR - National Wildlife Refuge
Refuge - Lost Trail National Wildlife Refuge
WPA - U.S. Fish and Wildlife Service, Waterfowl Production Area
WRP - US Department of Agriculture, Wetland Reserve Program

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PURPOSE FOR THE PROPOSED ACTION

The purpose of this Environmental Assessment (EA) is to evaluate the feasibility of establishing a hunting program on Lost Trail National Wildlife Refuge (Refuge). The Service is required under the National Wildlife Refuge System Improvement Act of 1997 (*16 USC 668dd*) to consider opening refuges to the six priority wildlife-dependent recreational uses, of which hunting is one. The decision to open a refuge to hunting must be consistent with principles of sound wildlife management, applicable wildlife objectives and otherwise be in the public interest (50 Code of Federal Regulations (CFR) 32.1). Hunting must be compatible with the refuge enabling legislation, and consistent with the Refuge Recreation Act of 1962, and the Refuge Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997. Hunting should also be evaluated in regards to the other priority wildlife-dependent recreational uses (fishing, wildlife observation, wildlife photography, environmental education and interpretation) to minimize conflicts while providing opportunities for a premier wildlife experience for all.

NEED FOR THE ACTION

The proposed action is to implement a hunting program on Lost Trail National Wildlife Refuge to provide the public with a high quality recreational experience. A hunting program must be compatible, and should instill positive values and high ethical standards, such as fair chase and sportsmanship, while providing a quality hunt. Policy of the U.S. Fish and Wildlife Service (FWS) Refuge Manual (8 RM 5.5) stipulates that hunting on refuges should be superior to that available on other public or private lands and should provide participants with reasonable harvest opportunities, uncrowded conditions, fewer conflicts between hunters, relatively undisturbed wildlife and limited interference from or dependence on mechanized aspects of the sport. Refuges are encouraged to set aside areas or times to promote hunting by youth to instill in them an appreciation for wildlife and the environment, while providing quality recreation and teaching proper hunting methods in a safe environment. The potential for crippling losses should be minimized and out-of-range shooting discouraged. Finally, hunting access and vehicle control should be planned to retain or improve the quality of the hunt and prevent disturbances to habitat, other hunters and wildlife. Land vehicles should only be used to provide access to the hunting area and not as a technique to make hunting easier, put wildlife at a disadvantage, or increase hunter success.

Refuge managers should offer wildlife-dependant recreation only to the extent that staff and funds are sufficient to develop, operate, and maintain the program to safe, high quality standards (Refuge Recreation Act). Managers should also rely on close cooperation and coordination with State Fish and Wildlife agencies in managing hunting opportunities on refuges and in setting refuge population goals and objectives.

ISSUES

During the development of the Environmental Assessment and conceptual management plan for acquisition of Lost Trail, and a refuge open house, several issues were raised by members of the public, State and Tribal representatives.

Establishment as a Refuge vs a Waterfowl Production Area

The Montana Power Company (MPC) purchased the Lost Trail Ranch in 1996 to partially satisfy a mitigative settlement order. This order was issued by the Federal Energy Regulatory Commission to the MPC, the Department of Interior, and the Confederated Salish and Kootenai Tribes (CSKT) to mitigate for wildlife losses and impacts associated with fluctuating water levels on Flathead Lake. This included damages to the Flathead Waterfowl Production Area (WPA) which is a unit of the National Wildlife Refuge System. MPC conveyed two tracts (3,100 acres) at opposite ends of the ranch to the FWS in 1999 to partially satisfy the settlement order. The future of the remaining ranch acreage between the two mitigation areas was uncertain. The Fish and Wildlife Service in partnership with the Natural Resources Conservation Service (NRCS) worked to protect this important connecting habitat. Under the auspices of the Wetland Reserve Program (WRP), the NRCS purchased a wetland easement from MPC on 1,707 acres within the Ranch. This acreage is located between the two conveyed parcels.

One of the alternatives in the Environmental Assessment and Conceptual Management Plan for acquisition of Lost Trail was to take ownership of the original 3,100 acres and not purchase the remainder of the Ranch. The Preferred Alternative outlined the importance of the remainder of the Ranch to the management and protection of the mitigated lands. In this alternative, the remaining 4,773 acres of the Lost Trail Ranch would be purchased in fee title and Montana Power Company would also turn over the grazing leases it held on 1,440 acres of timber and grazing land owned by the State of Montana within the Refuge acquisition boundary. These state lands and leases are administered by the Montana Department of Natural Resources and Conservation (DNRC). This 4,773 acres includes the NRCS 1,707 acre WRP easement. The use of a conservation easement was explored but was not a viable option for MPC. The partnership with NRCS and the availability of additional funding made the preferred alternative possible and the entire ranch was acquired establishing the 519th National Wildlife Refuge in August of 1999.

Since the mitigation order was to compensate for losses on Flathead WPA, some constituents felt Lost Trail should become a Waterfowl Protection Area. WPAs are added to the Refuge System under the Small Wetlands Acquisition Program. The total acreage proposed in the alternatives of the Acquisition EA for Lost Trail (3,100 acres and 4,773 acres) were too large to qualify under the Small Wetlands Acquisition Program. Therefore, both alternatives were discussed as being established as a National Wildlife Refuge.

Hunting on the Refuge One Year After Purchase

The Conceptual Management Plan in the Acquisition Decision Document for Lost Trail Ranch states, "Hunting will be based on compatibility, wildlife populations stability, administrative staffing, and funding for the operation of hunting programs. A hunting program will be initiated after one year of land purchase, with the availability of funding. During the one year planning phase, the Service will develop a hunting plan and evaluate the environmental effects, with public input, of a hunting program through an Environmental Assessment." The FWS purchased Lost Trail on August 24, 1999. Once purchased, the Refuge is officially open to hunting only after the effective date and final rule publication of refuge specific hunting regulations in the Federal Register. Submission deadline of hunting rules, regulations and seasons are required in January of each year for publication in the Federal Register. To meet the time line proposed in the Acquisition Environmental Assessment (EA), the FWS would have had to complete the required Endangered Species Act (ESA) and National Environmental Policy Act (NEPA) compliance, the hunt plan and compatibility determination, and associated public comment, prior to January 2000. It is not practical for the Service to be able to get a new refuge open to hunting in less than two years due to planning, development and publishing constraints. The statement in the Acquisition EA was an oversight by the Service. The purpose of this EA is to evaluate opening the Refuge to hunting in 2002.

Big Game Hunting

The majority of comments received supported the hunting of big game on the refuge. Hunting suggestions ranged from having the Refuge completely open to hunting following MFWP regulations and seasons to permit only, archery only, or muzzle loader only hunting. Several other comments indicated that people felt that National Wildlife Refuges should not be open to hunting or that hunting should only be permitted if necessary to maintain healthy habitat or wildlife populations. A few comments were received indicating a preference for big game hunting but with the condition that motorized transportation not be allowed. Some people commented that accessibility for special needs hunters should be accommodated.

Access Across the Refuge to Hunt on State and Plum Creek Lands

At a minimum, hunters and Montana Department of Fish Wildlife and Parks (MFWP) expressed a desire for access across the Refuge to hunt adjoining Plum Creek and DNRC lands. Service staff have completed a public use handout based on the Refuge acquisition EA providing limited public uses including access through the Refuge to Plum Creek and DNRC lands beginning September 1, 2001.

Trapping

Some individuals would like to see the Refuge open to trapping. This is a separate issue that will be addressed in the Comprehensive Conservation Plan.

Elk Seeking Refuge

MFWP is concerned that elk will quickly learn to seek sanctuary inside the Refuge if it is closed to hunting. Closure to hunting would lessen opportunities for hunters off the Refuge and may cause the herd to exceed the carrying capacity of available habitat. Limited private hunting occurred on what is now the Refuge prior to acquisition.

Tribal Subsistence

The Confederated Salish and Kootenai Tribes (CSKT) would like to see tribal subsistence hunting rights established at Lost Trail NWR based in part on the Hellgate Treaty and the courts. The Fish and Wildlife Service is currently seeking legal counsel on this issue and anticipates that the issue will be resolved outside of the context of the current proposed public hunting program.

Other Hunting Issues

Forty three people attended an open house at the Refuge on March 1, 2001 specifically in regards to establishing a hunting program. Many provided comments on the management of Lost Trail NWR. Others who did not attend the open house sent written comments over the next couple of weeks. Most of the comments and issues expressed were related to opening the Refuge to hunting. Comments ranged from not allowing hunting on the Refuge to opening the entire Refuge to hunting. Other comments included opening the uplands to hunting but not the bottom lands and allowing for special accessible hunting. A few comments suggested waterfowl hunting only, while others wanted the opportunity to shoot predators and ground squirrels. Concern has been expressed regarding populations of Columbian sharp-tailed grouse. Present MFWP regulations prohibit shooting of sharp-tailed grouse west of the continental divide and there is no known population of sharp-tails on or near the Refuge.

PLANNING PROCESS

The Refuge Improvement Act designated six wildlife dependent recreational uses to be given priority on National Wildlife Refuges if they are determined to be compatible with Refuge purposes and the Refuge system mission. The wildlife dependent recreational uses are wildlife observation, wildlife photography, environmental education, environmental interpretation, hunting and fishing. During the acquisition process and in the Acquisition Environmental Assessment, the FWS stated that hunting would be evaluated and potentially allowed within one year after purchase. The FWS missed that deadline as discussed earlier in this document. The development of a hunting EA and Hunt Plan has been accelerated due to the need for Federal Register publication submission in January of 2002 for any hunting activities which may occur during the 2002 hunting season. Following a review and analysis of public comments on the Hunt EA and the draft Hunt Plan, either a finding of no significant impact or the need for further in-depth analysis in the context of an Environmental Impact Statement will be determined. The approved preferred alternative will serve as the guideline for the development of the refuge

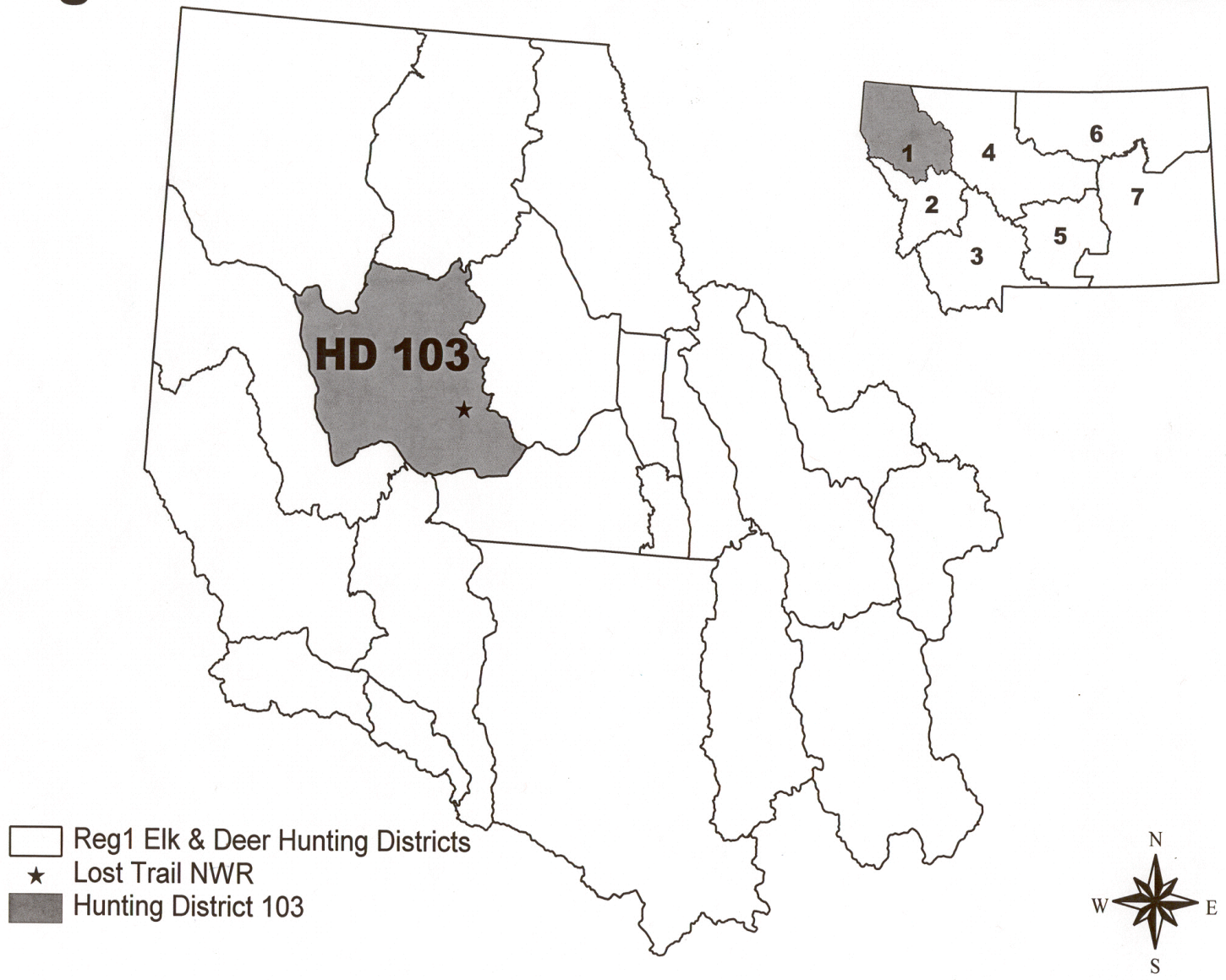
specific Hunt Plan. This plan will outline the specific details of how the hunt program will be carried out. The public will be requested to provide suggestions and input on the draft hunt plan. The hunt plan will be implemented in the Fall of 2002.

Refuge and regional office staff are also currently preparing a Comprehensive Conservation Plan for Lost Trail NWR. The National Wildlife Refuge Administration Act as amended by the National Wildlife Refuge Improvement Act of 1997 requires all National Wildlife Refuges to prepare a Comprehensive Conservation Plan (CCP). Its purpose is to guide refuge management for the subsequent 15 years. The normal time frame for a plan of this magnitude is two years from the "kick off" of the working group. The FWS anticipates releasing the draft Lost Trail CCP for public comment in March of 2002. The CCP will cover all management and public use activities on the Refuge. Since the hunt plan will have been established earlier, with appropriate public involvement already completed, it will be included as a step down management plan in an appendix of the CCP. Additional step-down management plans will be developed after CCP completion to guide activities conducted on refuges such as habitat and wildlife management, and the other priority public uses.

ALTERNATIVES

Six alternatives are being evaluated in this document. For discussion purposes these are titled: A: Limited Hunting, B: Designated Areas Hunting, C: Maximum Allowable Hunting, D: Special Permit Hunting, E: MFWP Alternative, and F: No Action (No Hunting). These alternatives describe hunting programs that incorporate various MFWP regulations. Lost Trail National Wildlife Refuge is located in MFWP Hunting District 103 of Region 1 (Figure 1). These alternatives resulted from input from the public during refuge acquisition comment periods, a Refuge open house, FWS, MFWP, DNRC and the CSKT.

Figure1. MFWP Administrative Boundaries



Alternative A (Limited Hunting)

Alternative A proposes to open Lost Trail National Wildlife Refuge to limited hunting. Archery only hunting would be allowed for elk and deer during the state archery and general big game seasons. Turkey and ruffed, blue and spruce grouse hunting would be allowed on the Refuge following MFWP regulations and seasons using bow and arrow or shotguns with federally approved non-toxic shotshells only. Waterfowl hunting would not be allowed. Hunting of moose, mountain lion, black bear, ground squirrels, coyotes, and furbearers would be prohibited, unless it becomes necessary as a management tool. Vehicle access to the Refuge would be limited to existing open roads such as the north 1019 road and the county road. Access by foot would be allowed throughout the Refuge during the open hunting seasons. Parking would be in designated areas only. Special Youth hunting and access for hunters with disabilities would be encouraged and accommodated following MFWP regulations. Youth hunting would be further encouraged by limiting the first week of archery deer and elk season to youths 12 -14 years of age accompanied by an adult and/or guardian who is at least 21 years of age. Hunters with disabilities in possession of a MFWP permit to hunt from a vehicle would be provided limited access to refuge management roads and trails.

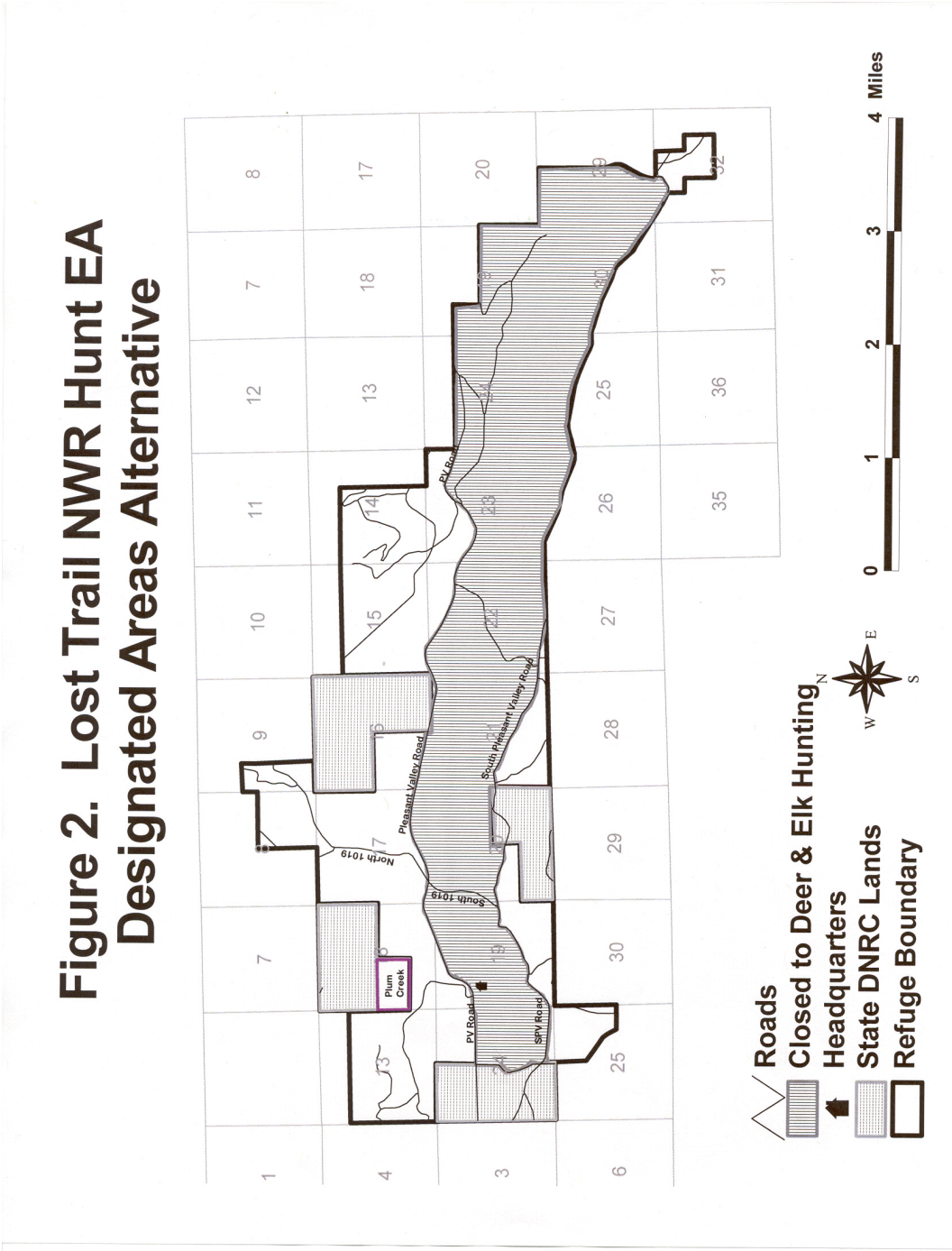
All or any part of the Refuge may be closed to hunting by the refuge manager whenever necessary to protect the resources of the area or in the event of an emergency endangering life or property. In addition, according to refuge policy (RM 5.436), yearly evaluation and monitoring for impacts from the hunt program will occur to determine if modifications to the hunt plan are necessary.

Alternative B (Designated Areas) **PREFERRED ALTERNATIVE**

This alternative would allow hunting of elk and deer following MFWP regulations (gun and archery) except within designated closed areas of the Refuge (Figure 2). No elk or deer hunting would be allowed between the county road (Pleasant Valley Road) and the South Pleasant Valley Road. Hunting of elk and deer would be permitted on any Refuge lands south or east of the South Pleasant Valley Road (southeast pond area) and north of the Pleasant Valley (county) road. Shotgun only hunting would be allowed for ruffed, blue and spruce grouse and both spring and fall turkey hunting. Grouse and turkey hunting would be allowed Refuge-wide. Hunting of moose, mountain lion, black bear, coyote, ground squirrels, furbearers and waterfowl would not be allowed on the Refuge. Vehicle access would be permitted on roads currently open to the public including the north 1019 road and the county road. Hunters would be required to park in designated parking areas to access areas open to hunting.

Special Youth hunting and access for hunters with disabilities would be encouraged and accommodated following MFWP regulations. Youth hunting will be further encouraged by limiting the first week of archery deer and elk season and the first week of the general deer and elk season to youths 12 -14 years of age accompanied by an adult and/or guardian who is at least 21 years of age. Hunters with disabilities in possession of a MFWP permit to hunt from a

vehicle will be provided limited access to refuge management roads and trails.



All or any part of the Refuge may be closed to hunting by the refuge manager whenever necessary to protect the resources of the area or in the event of an emergency endangering life or property. In addition, according to refuge policy (RM 5.436), yearly evaluation and monitoring for impacts from the hunt program will occur to determine if modifications to the hunt plan are necessary.

Alternative C (Maximum Allowable Hunting)

This alternative would allow the maximum amount of hunting within the bounds of the Refuge Administration Act, the enabling legislation, and the purpose of the Refuge. Deer and elk season would be open during archery and general big game season following MFWP regulations and seasons, and all legally permitted weapons would be allowed. There would be no closed areas on the Refuge except for safety zones adjacent to refuge facilities. The first weeks of archery and rifle seasons would be set aside for youth only hunting. The Refuge would also be open to moose, bear, lion, upland game bird and turkey hunting following MFWP seasons and regulations. Waterfowl hunting would be permitted on a designated 40% of the refuge. As in alternatives A and B, vehicle access would be allowed on the county road and the north 1019 road. All other access would be non-motorized. Motorized access on closed roads may be available to hunters with disabilities on a permit basis.

Predator hunting would be permitted, as would ground squirrel shooting. Trapping is not considered a part of hunting and is a separate issue that will be addressed in the Refuge Comprehensive Conservation Plan.

All or any part of the Refuge may be closed to hunting by the refuge manager whenever necessary to protect the resources of the area or in the event of an emergency endangering life or property. In addition, according to refuge policy (RM 5.436), yearly evaluation and monitoring for impacts from the hunt program will occur to determine if modifications to the hunt plan are necessary.

Alternative D (Special Permit Hunting)

Alternative D would open the Refuge for deer, elk, grouse and turkey hunting Refuge-wide following MFWP regulations. Deer and elk hunting would be allowed on a permit basis during the general big game season. Turkey and grouse hunting would follow MFWP seasons and regulations except the only legal “means of take” would be by shotgun with non-toxic shot. Hunting of moose, bear, lion, coyote, waterfowl, and ground squirrels would not be permitted on the Refuge.

There would be five tags issued, for the hunting of deer and elk, each of the five weeks in the general season. An additional tag each week would be reserved for MFWP authorized hunters

with disabilities. The drawing for all permits would be held the week before the opening of the

general big game season. Hunters would need to be present to participate. All successful hunters would be given an opportunity to choose the week in which they would like to hunt until all six slots for all five weeks were filled. Hunters with disabilities would also be required to attend the drawing and successful applicants would have vehicular access on designated closed roads of the Refuge.

Successful permit holders would be allowed to hunt the entire Refuge excluding safety zones around Refuge homes and facilities. Vehicle access would be permitted on all roads currently open to the public including the north 1019 road and the county road. Hunters would be required to park in designated parking areas to access areas open to hunting.

All or any part of the Refuge may be closed to hunting by the refuge manager whenever necessary to protect the resources of the area or in the event of an emergency endangering life or property. In addition, according to refuge policy (RM 5.436), yearly evaluation and monitoring for impacts from the hunt program will occur to determine if modifications to the hunt plan are necessary.

Alternative E (MFWP Proposal)

MFWP proposed the outline for this alternative during the internal review process of the draft EA. Although it is presented here as a separate alternative, alternatives A and B were also modified to incorporate some of the ideas suggested by MFWP.

Alternative E would allow hunting of elk and deer following MFWP regulations (gun and archery) except within designated closed areas of the Refuge (Figure 2). No elk or deer hunting would be allowed between the county road (Pleasant Valley Road) and the South Pleasant Valley Road. Hunting of elk and deer would be permitted on any Refuge lands south or east of the South Pleasant Valley Road (southeast pond area) and north of the Pleasant Valley (county) Road.

Special Youth hunting and access for hunters with disabilities would be encouraged and accommodated following MFWP regulations. Youth hunting will be further encouraged by limiting the first week of archery deer and elk season and the first week of the general deer and elk season to youths 12 -14 years of age accompanied by an adult and/or guardian who is at least 21 years of age. Hunters with disabilities in possession of a MFWP permit to hunt from a vehicle will be provided limited access to refuge management roads and trails.

Hunting of moose, bear, mountain lion, coyote and ground squirrel would not be permitted on the Refuge.

Waterfowl hunting would be permitted on a designated 40% of the refuge. The Refuge was acquired under authority of the Migratory Bird Conservation Act of 1929 which stipulates a maximum of 40% of total Refuge acreage can be opened to migratory waterfowl hunting.

Hunting for turkey and ruffed, blue and spruce grouse would be permitted following MFWP seasons and regulations except only non-toxic shotgun shot would be permitted on the Refuge. Hunting would be allowed Refuge-wide for these species.

Furbearer hunting would be allowed following MFWP seasons and regulations using rifle or shotgun with non-toxic shot. MFWP hunting regulations stipulate "Bobcat and wolverine are the only animals defined by law as furbearing animals that may be taken by hunting (MCA 87-2-601)". Trapping for other species listed as furbearers by MFWP (beaver, otter, muskrat, mink, marten, fisher, and swift fox) does not fall under the auspices of the Hunt EA and will be addressed in the Comprehensive Conservation Plan.

Vehicle access through the Refuge would be permitted on roads currently open to the public including the north 1019 road and the county road. Hunters would be required to park in designated parking areas to access areas open for hunting.

All or any part of the Refuge may be closed to hunting by the refuge manager whenever necessary to protect the resources of the area or in the event of an emergency endangering life or property. In addition, according to refuge policy (RM 5.436), yearly evaluation and monitoring for impacts from the hunt program will occur to determine if modifications to the hunt plan are necessary.

Alternative F (No Action)

Lost Trail National Wildlife Refuge was established in August of 1999. Refuges are closed to hunting until appropriate NEPA documentation, hunt plan and subsequent compatibility determination are completed. In this alternative, the Refuge would remain closed to hunting. Other wildlife orientated recreation such as viewing and photography would take precedence. Hunting would be re-evaluated if a biological need to reduce game or other wildlife species is documented.

Table 1. Hunting Alternatives

	Alternative A Limited Hunting	Alternative B Designated Areas PREFERRED	Alternative C Maximum Allowable Hunting	Alternative D Special Permitted Hunting	Alternative E* MFWP Proposal	Alternative F No Action
Elk & Deer	Archery only 11 weeks Refuge-wide	Rifle and Archery in designated areas	Rifle and Archery Refuge-wide following state regulations	Rifle and archery Refuge- wide during general season only with permit. Five permits issued per week.	Rifle and Archery in designated areas	Closed
Special Youth Hunt	1st week archery season	1st week archery and 1st week general season	1st week archery and 1st week general season	None	1st week archery and 1st week general season	None
Permits for hunters with disabilities	Yes	Yes	Yes	1 tag per week reserved for hunters with disabilities	Yes	None
Moose	Closed	Closed	Open following State Regulations	Closed	Closed	Closed
Black Bear	Closed	Closed	Open following State Regulations	Closed	Closed	Closed
Mountain Lion	Closed	Closed	Open following State Regulations	Closed	Closed	Closed
Waterfowl	Closed	Closed	Open following State regulations on 40% of Refuge	Closed	Open following State regulations on 40% of Refuge	Closed
Upland Game birds	Open following MFWP regulations except using bow and arrow or shotguns with non-toxic shot only.	Open following MFWP regulations except “means of take” limited to shotguns with non-toxic shot	Open following State regulations	Open following MFWP regulations except “means of take” limited to shotguns with non-toxic shot	Open following MFWP regulations except for use of non-toxic shot	Closed
Turkey	Open following MFWP regulations except for use of non-toxic shot	Open following MFWP regulations except “means of take” limited to shotguns with non-toxic shot	Open following State Regulations	Open following MFWP regulations except “means of take” limited to shotguns with non-toxic shot	Open following MFWP regulations except for use of non-toxic shot	Closed
Furbearers	Closed	Closed	Allowed	Closed	Open following State Regulations	Closed
Coyote	Closed	Closed	Open following State Regulations	Closed	Closed	Closed
Ground Squirrel	Closed	Closed	Allowed	Closed	Closed	Closed

* Alternatives A,B,C and D were also modified to reflect suggestions provided by MFWP during internal review.

Table 2. Hunting seasons for the state of Montana

Seasons	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
General big game												
Archery												
Turkey												
Upland game bird												
Black bear												
Moose												
Furbearer												
Migratory bird												
Mountain Lion												
*Ground Squirrel												
*Coyote												

* No hunting season designated. Open to taking all year. Designated "seasons" indicate traditional time frame for hunting of ground squirrel and coyote.

AFFECTED ENVIRONMENT

The Lost Trail National Wildlife Refuge is located in the west-central portion of Flathead County approximately 25 air-miles west of Kalispell, Montana. The 7,885 acre Refuge was established in August, 1999 under the authority of the Migratory Bird Conservation Act of 1929 for " ...use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 USC 715-715d, 715e, 715f-715r). Mitigation tracts obtained from the Montana Power Company were accepted under the Fish and Wildlife Coordination Act, "for the conservation and enhancement of fish and wildlife" (16 USC 661(1)-662(c)). Montana Power Company purchased the entire Ranch in August of 1996. A total of 3,112 acres of the Ranch were conveyed to the Fish and Wildlife Service as partial mitigation for losses on the Flathead Waterfowl Production Area attributed to past and future operations of Kerr Dam. The purpose of these mitigated properties is to protect and maintain wetland habitat for migratory birds, waterfowl and other species of animals and plants; to restore flood plain acreage to its historic role; and to enhance the survival of endangered and threatened species in the area. The remaining 4,773 acres of ranch property were purchased by the FWS utilizing Migratory Bird Conservation Fund money. The Natural Resources Conservation Service (NRCS) purchased a Wetland Reserve Program easement from Montana Power Company on approximately 1,707 acres within the above 4,773 acreage that is now Refuge. These lands are now owned by the U.S. Fish and Wildlife Service and managed in concert with NRCS. Public access and hunting are not restricted by the easement and are up to the discretion of the FWS. An additional 1,440 acres of DNRC lands within the Refuge acquisition boundary are leased by the FWS or Refuge neighbors.

The Refuge is located in a geographic drainage known locally as Pleasant Valley. The valley was formed during the Pleistocene Period by glacial and sedimentation activity. The glacial deposits sit atop the older belt rock formation, which in turn has faulted over younger Paleozoic rocks which are thought to contain oil and gas. A deep well was drilled a few miles northwest of the Refuge, but no significant mineral deposits were found. Soils consist of loams, silt loams, sandy loams, gravelly loams, and clay loams.

The topography of the Refuge consists of valley floor meadows, and sloping upland terrain areas dominated by timber. The Refuge is located in a long valley in which Pleasant Valley Creek flows south out of the mountains on the north side of the valley and then moves westward. Pleasant Valley Creek joins Meadow Creek, which flows out of Dahl Lake, east of the Horse Ranch Complex. The partially drained 160 acre Dahl Lake lies near the eastern boundary of the Refuge. Wetlands downstream of Dahl Lake have been altered by the channelization of Meadow Creek in an effort to create additional cropland and grazing areas. The channelization enables Dahl Lake and adjacent wetlands to partially drain by allowing flow to move west out of the Lake. Wetland development on the Refuge will likely involve reversing the effects of channelization thus restoring higher water levels in Dahl Lake and surrounding lowlands.

Elevations on the Refuge range from 3,488 feet to 4,600 feet. Habitat types consist of subirrigated wet meadows, grassy uplands and coniferous forests. The sub-irrigated wet

meadows are composed primarily of basin wild rye, cattail, rush, sedge and introduced meadow grasses dominated by reed canary grass and timothy. Upland areas are composed of a mosaic of prairie grasslands consisting of cool season native grasses (rough fescue, Idaho fescue, bluebunch wheatgrass, Columbia and Richardson's needlegrass and needle and thread), non native grasses (smooth brome, timothy, redtop and Kentucky bluegrass), noxious weeds (knapweed and tansy ragwort) and a diversity of other forbs. Coniferous forest are dominated by ponderosa pine, Douglas Fir, western larch and lodgepole pine. Other forest species include subalpine fir, grand fir, spruce, and cedar. Small pockets of aspen, birch and cottonwood are located throughout the Refuge.

The primary industry in the valley is agriculture, specifically beef cattle on the valley floor and timber production on the higher slopes. Neighbors to the Refuge include the Montana Department of Natural Resources and Conservation, the US Forest Service Flathead and Kootenai National Forests, Plum Creek Timber Company and two private ranches. Agricultural practices in the Pleasant Valley area are less intense than in other areas of Montana. The majority of lands within the valley consist of timber interspersed with large open hay meadows and pasture for cattle production.

The diverse habitats of the area sustain a wide variety of migratory bird species. Wetland habitats support 15 species of waterfowl including mallard, gadwall, cinnamon teal, blue-winged teal, lesser scaup, bufflehead, wood duck, ruddy duck, common goldeneye, common merganser, northern shoveler, redhead, wigeon, tundra swan and Canada goose. Many of these species nest on the refuge. Species of marsh and shorebirds present during the summer months include various species of grebes, herons, gulls, killdeer, sandhill cranes, dowitchers, sandpipers, snipe, bitterns, and black terns. Many raptor species, including northern harrier, red-tailed hawk, Swainson's hawk, American kestrel, and great-horned owl, have been observed on the refuge.

Resident wildlife that are attracted to the diverse habitats found on the Refuge include white-tailed deer, mule deer, elk and moose. Black bears and mountain lions are also common residents within the Refuge and surrounding Plum Creek timber lands. Upland game birds known to inhabit the area include spruce, blue and ruffed grouse. Eastern turkeys were transplanted to the area in 1999 and have split into four flocks with a total of approximately 150. Ring-necked pheasants have been transplanted into the area but do not survive the winters and have disappeared from the Refuge. The Refuge is also within the historic range of the Columbian sharp-tailed grouse, a U.S. Forest Service listed "sensitive species". Other forest-dependant species known to occur in the area include fisher, pine marten, lynx, wolverine and bobcat. These species are elusive but are thought to use the Refuge at least occasionally. A wolverine was seen on the Refuge in 2000.

Montana Power Company fisheries biologists surveyed Dahl Lake and Meadow and Pleasant Valley Creeks in 2000. Five fish species were found in the creeks; red-sided shiners, northern pike minnow, yellow perch, pumpkinseed and an unidentified sucker. Other species that may have occurred historically but unknown currently are the redband trout and the westslope cutthroat trout.
Several threatened and endangered species and "species of concern" inhabit the surrounding forests and have been known to utilize the Refuge. Species of concern are those known or suspected to be rare, endemic, disjunct, threatened or endangered throughout their range. A pair of bald eagles has nested on the Refuge in an aspen stand on the north shore of Dahl Lake. This pair fledged young for many years. The eagle nest was blown out of the tree in a severe wind storm during the summer of 2000. Two adult eagles constructed a nest in the same vicinity in 2001 but no young were produced.

A pack of wolves naturally recolonized into Pleasant Valley in 1988 from Canada. In 1989, there were 3 adults and 3 pups in the pack. Unfortunately they started to prey on livestock and were controlled both lethally and through relocation. A second pack formed in 1996 and had pups again in 1997 and 1998. Once again they started to prey on livestock and were removed in 1999. Although there was not a pack located in Pleasant Valley in 2000, lone wolves are occasionally observed.

Grizzly bears are becoming more common in the forests surrounding the Refuge. A grizzly was sighted by Plum Creek personnel one half mile south of the Refuge in 1997. Lynx are also known to inhabit forest lands in the area and may be present on the Refuge.

Species of concern or Montana Partners in Flight bird conservation priority species known to utilize the Refuge include black tern, horned grebe, hooded merganser, lesser scaup, ruffed grouse, olive-sided flycatcher, grasshopper sparrow, willow flycatcher and pileated woodpecker. Other species listed on the Montana Partners in Flight priority list that could potentially exist on Lost Trail include: Level 1 - Black-backed woodpecker, Sprague's pipit, and Baird's sparrow; Level 2 - includes many species, e.g., long-billed curlew, Forster's Tern and Lewis' woodpecker. Montana Partners in Flight Level I species are those exhibiting a declining population trend and the areas they are found in are of high importance for conservation (i.e., they are not just of local concern.). Level II species are those for which the state has a responsibility, but there is a lesser threat or they have a stable/increasing population in the state. Montana has a high responsibility to monitor the status of these species, and/or to design conservation actions (MTPIF 2000).

Elk

Elk were not plentiful in the Pleasant Valley and Fisher/Thompson River area until MFWP made consecutive transplants of 27 and 29 elk into the Wolf Creek drainage in 1927 and 1928, and 105 elk into the Fisher River drainage in 1929. The elk from these three transplants thrived and multiplied into the healthy, self-sustaining herd present today. Some of the transplanted elk came from the National Bison Range. In 1992, an Elk Management Plan was developed by Montana

Department of Fish, Wildlife and Parks (MFWP) in which the state was divided into elk management units (EMUs). The Salish EMU covers northwestern Montana from Eureka to the Flathead Indian Reservation and includes Lost Trail NWR. There are three population objectives for this EMU: 1) increase elk numbers by 30%, from 2,300 to 2,990; 2) maintain an observed winter bull:cow ratio of 10 per 100; and 3) maintain a minimum winter calf:cow ratio of 30 per 100. MFWP conducts aerial surveys each spring to obtain population information and has data compiled back to the 1970's. Table 3 shows the comparison of elk sex and age classification for Region 1 and HD 103 completed from spring survey from 1980 to 2000. Total elk observed in 2000 was 2,995. In general, elk populations were relatively low in the 70's then increased in the mid 80's until a high of 3,329 elk were observed on the 1994 count. MFWP biologists believe that beyond this point the population was limited by habitat restraints (personal communication, Jerry Brown - MFWP). The populations remained high until the winter of 1996/97 when severe weather conditions reduced elk and deer herds throughout northwest Montana. All segments of the elk population in northwestern Montana have increased since the hard winter of 1996/97. By far the largest increase has occurred in the antlerless segment of the population with an increase of almost 1,000 elk in the past four years. As of 2000, the population goals for herd numbers in the Salish EMU have been met.

Lost Trail National Wildlife Refuge is located in Hunting District 103 for the MFWP big game regulations. In this district, the calf/cow ratio has consistently been above the management objective in the Salish EMU of 30:100. This is true for all years except 1994, and 1997 and 1998 when the herd was still recovering from the hard winter of 1996/97. The bull/cow ratio has traditionally been low in this hunting district, however, this is more a factor of the time of year of the count and the sightability of bulls in the forests than of a lack of bulls. This is supported by the continued harvest of mature bulls each year and the high calf to cow ratio.

Elk in Hunting District 103 are currently hunted under a brow-tined bull only restriction and a special permit allocation for 50 anterless elk. The archery only season runs from the first week in September until mid-October, approximately 6 weeks. General Season opens the fifth Sunday preceding Thanksgiving weekend and runs for 5 weeks closing on the Sunday after Thanksgiving.

Table 3. Elk Composition from Spring Survey Data, Salish EMU (MFWP).

Year	Total Population		Calves per 100 Cows		Bulls per 100 Cows	
	Region 1	HD 103	Region 1	HD 103	Region 1	HD 103
1980	1650	154	24	52	19	19
1981	1801	71	31	42	18	42
1982	1777	132	29	31	19	11
1983	2188	134	26	31	19	22
1984	2038	68	33	40	25	6
1985	1685	251	26	40	11	5
1986	2172	23	43	54	18	23
1987	2507	259	35	34	14	4
1988	2763	72	45	39	17	2
1989	3064	52	35	31	16	14
1990	3278	244	33	43	17	9
1991	2827	203	29	41	15	10
1992	2501	54	32	44	21	56
1993	3239	104	26	44	18	19
1994	3329	99	28	20	18	11
1995	2787	127	32	33	14	17
1996	2025	107	21	50	11	7
1997	2425	89	20	21	8	4
1998	1880	48	18	18	10	5
1999	2841	205	33	40	12	11
2000	2995	218	32	47	13	4

White-tailed Deer

Refuge staff have not conducted population counts on white-tailed deer on the Refuge, however, general observations indicate that white-tailed deer are common at lower elevations. Estimating white-tailed deer populations and composition numbers in the forested habitats of western Montana with any precision is difficult. MFWP uses population indices from specific representative areas and harvest data collected from game check stations to determine population trends for white-tailed deer. This data is used to make management decisions and set hunting seasons. Lost Trail NWR is located within HD 103 of MFWP Region 1 (Figure 1).

A white-tailed deer study conducted in MFWP Region 1 since 1998 shows the following;
• Adult female survival is high - 84%.
• Adult male survival is moderate - 59%.
• Fawn survival from 6 to 12 months is 74%.
• The most consistent mortality factor for adult females through time is hunter related harvest; 2-8%. (when antlerless hunting permitted.)
• Severe winters appear to be the primary mechanism regulating populations. The 1996-97 winter, combined with high antlerless harvest in the split 1st and 5th week of the general season in 1996 produced a detectable decline in populations the next year.
• Fawn recruitment has exceeded adult female death, and populations expanded from the mid to late 1980's until the winter of 96/97. (Unpublished research - Carolyn Sime - 2000)

The MFWP Region 1 white-tailed deer harvest in 1999 represents a 12.5 percent increase over 1998 and a 20 percent increase from the 1997 low point. Even though the buck harvest trend data increased from 1997 through 1999, it was as low as the levels observed in the early 1980's. Reasons for the recent years low harvest levels include reduced population size from winter related mortality in the 1996-97 biological year, and a “bucks only” hunting season in place since 1998.

The MFWP Region 1 buck harvest was comprised of 60 percent yearlings, which was the highest harvest rate for yearling bucks in at least 15 years. Reasons for the high harvest of yearlings bucks include high recruitment in the spring of 1999 and a change to a bucks only hunting season regulation for the 1998 and 1999 season.

MFWP Region 1 had the highest buck harvest in the state and Hunting District 103 (which includes Lost Trail) ranked third in the Region with 767 bucks harvested. Hunting District 103 had the heaviest hunting pressure in the Region with 22,328 hunter days. On average it took 29 days to harvest a white-tailed deer with an 26 % success rate. Research shows that harvest increases as linear road miles increases and the greatest number of hunters hunt in hunting districts with the greatest linear miles of roads. The highest miles of roads and the highest harvests were in Hunting Districts 100 and 103. (Report to MFWP - Carolyn Sime - 2000). Therefore, Lost Trail NWR is within a hunting district with great potential for hunter recreation in regards to available roads.

MFWP Region 1 spring survey results shows recruitment to be strong for the third year in a row with trend surveys indicating 47 fawns per 100 does from 178 deer tallied. Currently HD 103 allows for a six week, either sex, archery season, and a 5 week general season with the 1st week either sex and the remainder of the season bucks only. Lost Trail NWR is in an area that supports a healthy regional population of white-tailed deer.

Mule Deer

Mule deer are occasionally observed on the uplands of Lost Trail National Wildlife Refuge. No formal surveys of mule deer have been conducted by Refuge staff. MFWP monitors mule deer in five survey areas in Region 1. One of these survey areas is the Fisher River which is located approximately 15 miles west of the Refuge. Surveys are conducted in late April or early May and are scheduled to coincide with deer concentrations during green-up. The primary intent of these surveys is to gather information on population trend and fawn:adult ratios.

In the spring of 2000, 2,805 mule deer were observed including 1,318 adults, 660 fawns and 827 unclassified. This number is up considerably from 1998 and 1999 levels with an increase of 17% from 1999 to 2000. The fawn to doe ratio was 50% for 2000. This is identical to the 1999 ratio and represents one of the highest fawn:doe ratios in Region 1 history. The winters of 1997-98, 1998-99 and 1999-2000 were all relatively mild at lower elevations. In contrast, the winter of 1996-97 was one of the most severe in Region 1 history.

In response to statewide concern over mule deer populations, MFWP began adaptive deer management in 1996. Guidelines were developed to recommend standard, restrictive or liberal hunting regulations based on recruitment, the proportion of the buck harvest comprised of yearlings, total buck harvest or the total number of deer observed on spring surveys, and the percent of bucks four-point or greater. (See MFWP Region 1 Mule Deer Report or contact MFWP for further details on the Adaptive Mule Deer Management.) The objective for the Northwest Montana ecosystem is to "Maintain the population within 25% of the long-term average (at least 10 years) as measured by the total number of bucks harvested or the total number of deer observed during spring on areas where aerial surveys are feasible."

Currently, the Region 1 mule deer general season is 5 weeks of antlered only hunting and archers are also restricted to antlered only. Two hundred Youth Permits are available in Region One that allow the holder to take antlerless white-tailed or mule deer.

Hunting District 103 had a maximum harvest in 1992 with 766 mule deer taken (Table 4). Since then, harvest has decreased dramatically with a low of 169 harvested in 1996. In 1999, 1,217 mule deer were harvested in Region 1 with Hunting District 103, which includes Lost Trail NWR, reporting the highest mule deer harvested in the Region with a total of 245. The reason for the overall decline in harvest is not completely understood but may be related to weather, predation, over-hunting, declining habitat quality, change in hunting seasons, decline in number of hunters or a combination of all these factors.

Table 4. Mule Deer Harvest Statistics Hunting District 103 (Montana Department of Fish, Wildlife, and Parks)

Year	Hunters	Total Harvest	Days
1990	4,466	500	24,309
1991	4,914	522	26,813
1992	5,555	766	31,146
1993	5,798	483	31,264
1994	5,416	239	28,756
1995	4,964	441	27,878
1996	no data	169	no data
1997	3,828	217	21,306
1998	3,375	195	20,746
1999	3,796	245	22,328

Moose

No formal moose survey has been conducted by Refuge staff on Lost Trail National Wildlife Refuge. MFWP conducts several moose survey routes in northwestern Montana. Lost Trail National Wildlife Refuge lies in State moose Hunting District 106. This is not one of the six Hunting Districts surveyed yearly by the state, however, these routes were chosen in major moose habitat to establish moose trend monitoring for the entire region.

Low calf recruitment in northwest Montana has been a problem since the early 1990s. Increased hunting pressure with a 118% increase in the number of moose permits allocated in Region 1 from 1970 to 1990, low calf recruitment, and the hard winter of 1996 all contributed to a decline in moose numbers. In 1995, MFWP began reducing the number of permits issued and current levels are comparable to the 1970s. Calf recruitment has shown a marked increase in 1998 and 1999. (MFWP Region 1 Annual Moose Report 1999)

A general trend in Region 1, and in Hunting District 106, has been an increased harvest success rate by moose hunters. Although success rates have remained high, it has required more effort from the individual hunter to harvest a moose. In the mid-to late 1980s, hunters averaged seven days to successfully harvest a moose. In the last five years, it has required an average of 15.6 days to harvest a moose (Table 5). The high success rate indicates a willingness of hunters to expend the extra effort required to harvest a moose. Members of the Confederated Salish and Kootenai Tribes are permitted to hunt moose without a permit on open and unclaimed (U. S. Forest Service) lands in northwestern Montana.

Table 5. Hunting District 106, Moose Harvest (MFWP)

Year	# Permits	# Hunters	Harvest	% Success	Hunter Effort (Days)	CSKT Harvest	Total Legal Harvest
1990	20	20	18	90	6	3	21
1991	20	20	20	100	7	4	24
1992	25	25	24	96	7	4	28
1993	25	25	24	96	10	5	29
1994	25	25	25	100	6	3	28
1995	25	25	19	76	21	1	20
1996	25	25	22	88	13	0	22
1997	25	25	23	92	15	1	24
1998	20	20	16	80	14	0	16
1999	15	15	15	100	15	0	15

Information gathered from moose jaw information shows an upward trend in average age for bull and cow moose since 1984. This information only reflects harvest data and may be a result of hunters selecting for older bulls rather than a true increase in age. However, inspection of the data showing older age class animals in the harvest and increased hunter effort, combined with low calf:cow ratios suggest an aging moose population with poor calf recruitment rates.

Black Bear

Black bear use of Lost Trail National Wildlife Refuge has not been formally surveyed by Refuge staff or MFWP. However, MFWP biologists familiar with the region assess the Pleasant Valley area as having a healthy black bear population (Personal communication, Jim Williams, MFWP, 2001). Black bears have occasionally been observed by Refuge staff during routine duties.

According to Harvest Questionnaire data, since the early 1970s, the number of black bear hunters in Region 1 has tripled, overall harvest has remained relatively constant, hunter effort per harvested black bear has increased and hunter success has declined. Montana requires mandatory check of harvested black bears. Seven hundred and sixteen bears were checked statewide in 1998 which was the highest number recorded since the mandatory harvest report program began in 1985. These numbers are not necessarily a reflection of an increase in black bear population. The spring 1998 season provided ideal conditions for hunting black bears. Warm weather and good forage development along roadsides combined with a poor huckleberry crop in the mountains

brought bears down to lower elevations and into contact with hunters. Five hundred and sixty-nine black bears were checked in 1999 which was about six percent above the long-term average of 538. Record harvests were recorded in 1997 (655) and 1998 (716).

Current data from the Region 1 black bear harvest indicates a gradually declining age structure. However, changes in population age structure can be subtle in long lived animals like black bear. Black bear production is dependent on forage availability the previous summer and fall. Survival of yearlings is also heavily tied to the availability of forage during their second summer/fall. Region 1 black bear production and recruitment was moderate in 1995 and 1996 and poor to extremely poor for 1997, 1998, and 1999. Huckleberry production for the summer/fall 1999 was fair, and cub production for 2000 is anticipated to be low to moderate.

The only survey conducted for live bears in Region 1 is conducted on the Kootenai National Forest in the Cabinet Mountains. These flights indicate a density of 4.72 black bears per square mile. Research conducted in the same area show the average age of first reproduction of black bears in western Montana to be 5 or 6 years. Sows usually produce young every two years.

Mountain Lion

MFWP obtains mountain lion population trend data from track surveys and harvest information. Forest carnivore transect routes were established in 1992. These transects were designed to sample lynx, wolverine, and fisher and were not specifically located in areas with high densities of lions. They are also conducted at the latter part of the lion season or immediately after the close of the season. The information that is available from track surveys indicates that lion populations increased from 1992 to 1995, decreased in 1997 and 1998 and hit a low in 1999. Another source of lion population information is the number of problem lions encountered each year. From 1992 to 1994, the total number of lions killed in self-defense or damage control rose from 11 to 35. In 1995, the total number of lion kills dropped to eight but increased steadily for the next three years and reached 24 in 1998. In 1999, the total control/defense kill decreased to six. Increases in problem lions may be related to an increase in the lion population, or an increase in the number of young lions in the population. Younger lions are typically involved in human/lion conflicts. An increase in housing development in traditional lion habitat has also led to an increase in human/lion conflicts.

Population age structure can be obtained from harvest information. Between 1988 and 1992, the age structure reversed from being composed of mostly young and middle-age lions to old and middle-age lions. The average age of harvested lions increased from three years old in 1988 to six years in 1992. From 1992 to 1997, the age structure of the population reversed again. In 1992, lions less than or equal to 2 years old composed 11% of the harvest. In 1997, these age classes represented 50% of the harvest.

Table 6 shows the quota set by the state in Hunting District 103, the number of lions actually

harvested, and the number of days the season remained open. Over harvest was a result of several factors; separate quotas for males and females, a 48 hour reporting period, a 48 hour closing period after quotas were reached, and an inability of hunters to report kills on weekends. To alleviate this problem, quotas were changed to either sex, the reporting period and closing period were reduced to 24 hours, and a 24 hour a day automated phone reporting system was initiated. Managers were also permitted to close a Hunting District within 24 hours of when 80% of the quota was reached. Because of these changes, the harvest of lions was less than the quota for the first time in 1999. In 2000, the total quota for lions in Hunting District 103 was nine lions of either sex. The season was opened for four days, closing on December 4 with a total of 16 lions being harvested by the time the harvest closing could be enacted.

Table 6. Mountain Lion Quota and Harvest Data for Hunting District 103 (MFWP)

Year	1994	1995	1996	1997	1998	1999	2000
Quota	10	10	15	15	16	12	9
Harvest	16	16	24	19	26	10	16
Days Open	8	6	15	24	9	10	4

Mountain lion hunting was changed to a permit only season in Hunting District 103 for the 2001 season. There are 12 permits allocated in this Hunting District. Traditionally lion hunting is conducted with the use of dogs. MFWP allows houndsmen to chase lion only from December 1 through April 14 without a permit.

Upland Game Birds

Upland game birds present in the Lost Trail NWR vicinity include ruffed, spruce and blue grouse all commonly referred to as moutain grouse. Mountain Grouse populations have not been surveyed on Lost Trail NWR, however habitat exists for all three species. Ring-necked pheasants and Hungarian partridge are not found in the valley. Ring-necked pheasant were released in the Lost Trail NWR area but did not survive the winters. MFWP monitors all game bird species through harvest reports. In 1999, Region 1, of seven regions statewide, produced 63% of Montana's harvest of ruffed grouse, 50% of the harvest of spruce grouse and 30% of the harvest of blue grouse for an average of 49% of Montana's mountain grouse harvest. Table 5 shows the harvest data for Flathead county for 1999.

Columbian Sharp-tailed grouse are not present on the refuge and do not have an open season west of the continental divide in Montana (Personal communication, Alan Wood, MFWP, 2001). There is a very small population within Region 1 which has continued to decline despite the ban on hunting and significant habitat restoration effort and management emphasis.

Table 7. Mountain Grouse Harvest Data for Flathead County, 1999 (Montana Department of Fish, Wildlife & Parks)

Species	Hunters	Hunter Days	Harvest	% Success
Ruffed Grouse	1,907	15,042	6,443	70
Spruce Grouse	995	8,433	1302	36
Blue Grouse	1,293	10,306	2,112	41

The ruffed grouse harvest for the last three years in Flathead county has been 6,636 in 1997, 7,111 in 1998 and 6,443 in 1999 with hunter success rates of 74, 76 and 70 percent, respectively. Grouse populations in northwestern Montana appear to be stable with population fluctuations affected by climatic conditions during spring nesting season and winter.

Turkey

Turkey are not a species for which the Refuge was established and are not indigenous to Montana. However, they have been relocated in numerous areas and provide a high quality hunting experience for many sportspersons. MFWP transplanted wild turkeys to the Pleasant Valley area in 1999. These relocated birds have prospered to such a degree that hunting has recently been implemented as a management activity by MFWP. Currently, local populations estimates total approximately 150 birds among four flocks.

RATIONALE

Rationale and Impacts - Alternative A - Limited Hunting

This alternative meets FWS policy by providing compatible hunting opportunities on the Refuge for elk, deer, mountain grouse and turkey. An archery only big game hunt will discourage herd shooting and shooting from the road. It will also reduce crippling and loss of animals due to out of-range-shooting. These factors will provide more opportunity for individual quality hunts with reasonable harvest opportunities, with uncrowded conditions and relatively undisturbed wildlife. By the nature of the sport, bow hunters are required to have better target identification and proximity to the animal which promotes better hunting techniques. Bow hunting is potentially less disruptive to non-target species and other priority wildlife-dependent public uses such as wildlife viewing and photography. Because of the nature of the topography and roads, bow hunting will be safer than rifle hunting which could pose risks to other Refuge users. The concern expressed by MFWP that elk and deer will seek protection on the Refuge during the hunting season will be alleviated as bow hunters will disperse elk and deer off the Refuge prior to, and during the general season.

Spring and fall turkey hunting would be allowed under this alternative utilizing non-toxic shotshells or bow and arrow. Turkeys are not indigenous to Montana. They were released by the

MFWP to increase hunting opportunities. The fall turkey season runs from September 1 to December 15. Hunting of turkey is not considered detrimental to the biological integrity of the Refuge, is not likely to create conflict with other public uses and is within the wildlife dependent public uses to be given priority consideration. Currently, Flathead County has a permit only season with a total of 300 either-sex permits issued for the fall of 2001. The only legal means of take are shotgun and bow and arrow. Since turkeys are not endemic to this area, they are not a priority species in Refuge management considerations. They are a popular game species though, and the public interest would best be served by allowing this activity on the Refuge. There may be a law enforcement issue with this alternative. Turkey hunters may possess shotguns on the Refuge during deer and elk season which, in this alternative, is open for archery only hunting. This should not become a major issue as turkey hunters should be carrying shotshells only and should not have the shotgun slugs necessary to take big game in their possession. Spring turkey season runs from the first week in April to the first week in May. A total of 200 permits were issued in 2001 by MFWP for spring turkey hunting in Flathead County. Spring turkey hunting may cause minimal disturbance to nesting migratory birds. Spring green-up is late in Pleasant Valley and many species will not have initiated nesting before the end of the spring turkey season.

Mountain grouse hunting with bow and arrow or shotgun using non-toxic shot only will be open on the Refuge. Grouse populations in northwestern Montana are healthy even though nest success fluctuates greatly due to climatic conditions. No surveys have been conducted to evaluate grouse populations on the Refuge. However, approximately 50% of all mountain grouse harvested in Montana are taken in MFWP Region 1 of 7 regions. Refuge purposes do not include these species of resident game birds. Fall hunting of mountain grouse will not have a significant impact on the Refuge's migratory bird purpose since nearly all migratory bird production will have occurred before the season opens. Hunting of mountain grouse is consistent with FWS policy on providing compatible hunting opportunities especially given their lack of viewing opportunities, non-priority status, healthy population level and being resident game.

Moose hunting will not be allowed due to the limited number of individual moose within the Refuge boundary. The Fish and Wildlife Service must consider all priority wildlife-dependent public uses such as wildlife viewing and photography. Moose hunting on the Refuge would further decrease moose numbers through harvest and disturbance which would result in reduced chances of viewing and photography by other refuge visitors. In addition, moose hunting in this district is limited to a permit only season. In 2000, 15 permits were issued in hunting district 106 which includes Lost Trail NWR. The success rate of hunters holding permits is high, suggesting hunting on the Refuge is not needed to meet harvest quotas.

The primary purpose of Lost Trail NWR is for migratory birds (waterfowl, waterbirds, songbirds, etc.). Waterfowl hunting will not be available initially due to a low population of ducks and geese using the Refuge during the hunting season. Opening the Refuge to waterfowl hunting at this time would not provide a quality hunt, nor provide for a reasonable harvest opportunity. Crowded conditions could arise depending upon the number of hunters and the distribution of the

limited number of waterfowl. Further, freeze up occurs early in this valley limiting the length of the season. For these reasons, there is little merit to allow a hunt that could detract from other public uses or disturb wildlife and habitat unnecessarily. Human disturbance, whether it be from hunters or birdwatchers, may reduce the overall carrying capacity of a staging area for waterfowl and other waterbirds (Pfister et al. 1992). Better waterfowl hunting opportunities are available on other State and Federal lands in the Flathead Valley. Waterfowl populations and habitats on the Refuge will be evaluated in the future to determine the potential for hunting opportunities. Restoration of Dahl Lake and the restoration and enhancement of other wetlands both on the Natural Resource Conservation Service easement area and on other parts of the Refuge may increase fall waterfowl populations.

Lion hunting and chase will not be permitted on Lost Trail National Wildlife Refuge under this alternative. Mountain lion hunting was changed to a permit only season in hunting district 103 for the 2001 season. There are 12 permits allocated in this hunting district. Prior to 2001, the season had been open until a quota was reached. In 2000, the total quota for lions in hunting district 103 was 9 lions of either sex. The season was opened for four days, closing on December 4 with a total of 16 lions being harvested. Traditionally lion hunting is conducted with the use of dogs. The State allows houndsmen to chase lion from December 1 through April 14 even after harvest quotas are reached. Often these dogs are not species-specific and will harass other wildlife. Lion hunting and chase on the Refuge would be disruptive to other wildlife, is not necessary to meet state quotas, and could have a negative effect on other priority public uses.

Hunting of black bear will not be allowed on the Refuge. Abundant opportunities to harvest black bear exist outside the Refuge. The spring season from April 15 to May 31 could be disruptive to nesting waterfowl and grassland birds, the primary purpose for which the Refuge was established. Black bears are a popular species for the viewing public. The opportunity for observation of black bears by other Refuge users would be reduced with the hunting of bear on the Refuge.

Ground squirrel hunting is not regulated by the MFWP. Previous ranch owners allowed ground squirrel shooting by guests and it has become a tradition to some. Ground squirrel shooting does not meet the guidance from the FWS Refuge Manual to provide a quality hunting experience, and encourage the highest standards of ethical behavior. Harvested animals are not utilized. Taking animals just for the sake of shooting them does not reflect positively on the FWS or National Wildlife Refuge System and does not incorporate a message of stewardship. Ground squirrel shooting would occur during spring and summer when the squirrels are out of hibernation. This could cause disturbance to nesting birds as well as other priority wildlife dependant public uses of the Refuge. At this time, there is no documented population or habitat management need for controlling ground squirrels.

Coyote hunting will not be allowed on the Refuge. Coyote hunting is permitted on Plum Creek Timber Company and State lands adjacent to the Refuge allowing for abundant opportunities to harvest coyotes. Coyote hunting could be disruptive to other resident wildlife and coyotes are a

species popular to the wildlife viewing public. Coyotes have also been shown to displace fox which are highly efficient nest predators. Coyotes are less efficient nest predators, thereby their presence could actually help increase nesting success for ground-nesting birds (Sovada et al., 1995).

This alternative would provide for a long deer and elk season (approximately 11 weeks) while minimizing the impacts on other wildlife species and other public uses. It would provide for a quality hunt with maximum safety. There would also be minimum impact to nesting birds by maximizing hunting opportunities in the fall season. This alternative does allow for a spring turkey season which could result in minimal disturbance to nesting birds and fawning and calving of deer and elk through disturbance. This disturbance would be directly related to spring turkey hunter numbers. Disturbance to wildlife by hunters may result in some wildlife being hazed off the Refuge limiting the opportunities for viewing, photography, environmental education and environmental interpretation.

The U.S. Fish and Wildlife Service Refuge Manual (8 RM 5.4) stipulates that the potential for crippling losses should be minimized. Alternative A proposes an archery only season on elk, white-tailed and mule deer. Several studies have been conducted throughout the United States on the rate of crippling losses due to archery hunting versus rifle hunting. Stormer et al. (1979) determined that the per capita wounding rate by archers was 1.5 times that of gun hunters. Proceedings of the 25th Annual Conference of Southeastern Association of Game and Fish commissioners (1971) indicate that crippling loss due to archery was 50%, shotgun hunting with buckshot 26% and shotgun hunting with slugs 7%. Studies in Texas, Boydston and Gore (1987) indicate a 7 percent wounding rate from guns compared to a 50 percent wounding rate for archery hunting. Thus for every deer bagged with a bow and arrow, one was hit but not retrieved.

The state of California was sued over the issue of allowing an archery hunt on black bears in 1990. As a result of this law suit, an extensive review of the literature was completed in 1991. The following is a summary of some of the issues addressed in the literature.

- Bowhunters have a lower success rate than firearms hunters - In California in 1990, archery hunters had a success rate of 7% compared to a general hunter success rate of 10%. Similar results were found by Downing (1971), Fuller (1990), Stormer et al. (1979), Langenau and Aho (1983), Lemke (1990), Benke (1989), and others.
- Broadhead arrows cause less trauma to surrounding tissue than bullets. - Little disagreement exists on this issue. Work by Ludbrook and Tomkinson (1985) shows that, when an arrow fitted with a sharp broadhead strikes a nonvital area, a minimum of surrounding tissue damage occurs. They stated that arrow wounds sustained by animals in nonvital places were most likely to heal completely because of the lack of extensive tissue damage compared to gunshot wounds. Similar conclusions can be drawn from data collected by the Lonestar Bowhunter Association (1989), where archers experienced “through” shots (total pass through

of the arrow) on 46 of 102 deer killed.

- Evidence from necropsy studies indicate that relatively few deer suffer from crippling injuries, whether caused naturally or from hunting. Deer with natural or hunting related wounds appear to recover with little or no external manifestation of the injury (Nettles et al 1976).

The Idaho Department of Fish and Game (1991) conducted a five year study of radio-collared elk mortality factors. Forty-three elk were recorded as rifle kill, two were archery kill, seven were wounded and lost rifle kills, four were wounded and lost archery kills, three were poached and 10 died of other mortality factors. Thus archery hunters wounded less total elk than rifle hunters. However for every successful elk harvested by archery hunters 2 more were lost to wounding while rifle hunters wounded only .16 elk per successful kill. Three reasons are given by Boydston and Gore (1987) for the high wounding rate of archery versus gun hunting; 1) arrows are low velocity, high trajectory projectiles which kill primarily by circulatory hemorrhage. The broadhead must cut major blood vessels, thoracic organs, or neurological centers to cause a quick death. 2) Under most hunting conditions, it is generally difficult to shoot a razor-sharp broadhead arrow into a vital area--an absolute must for bow hunting proficiency. Data from Texas wildlife management areas provide evidence that, on the average, 21 shots are made for every deer killed, or about 10 shots per deer hit. 3) Unless there is a relatively low exit wound in thoracic hits, most bleeding is internal, resulting in poor blood trails.

Finally, Lemke (1990) discusses a study conducted by the Montana Department of Fish, Wildlife and Parks. Biologists monitored 535 radio-collared elk. Over a 6 year period, 11 (1.5 percent) of the elk were killed by bowhunters, while gun hunters killed 262 (36 percent). Bowhunters wounded 4 elk. The author stated that “most of the concerns about bow hunting appear to come from public perception and social preferences rather than available biological information”.

In general the studies outlined above show that per capita crippling losses are greater with archery hunters as compared to rifle hunters. However, the total number of animals crippled may be less with archery hunting due to the reduced number of hunters participating in the sport.

Rationale and impacts - Alternative B - Designated Areas (PREFERRED ALTERNATIVE)

This alternative allows a high percentage of the hunting public to participate. It also protects the bottomlands, including the majority of the wetlands, from most hunting disturbances. Viewing and photography opportunities may be increased in the bottomlands where wildlife is protected from big game hunting disturbance. Opening the Refuge to rifle hunting during the general season may increase dispersal of elk and deer off the Refuge in the uplands allowing a higher harvest potential off the Refuge which would decrease the chance of an overpopulation of deer and elk. Limiting spring hunting to turkey only, will minimize disturbance to nesting birds which may increase nest establishment and success. Having a closed area in the bottom lands may cause an increase in disturbance on the uplands to wildlife, other hunters, and other Refuge users.

This alternative will require a moderate law enforcement presence due to an unlimited number of hunters, the existence of a closed area, and the use of rifles on the Refuge. Much of this habitat, especially in the lower elevations, is open and provides easy viewing from existing roads. Although there may be a temptation to shoot from the road into the uplands, the existence of the closed area where no big game hunting is allowed should reduce this risk in the bottomlands. Furthermore, Montana law prohibiting shooting from roadways and Refuge Officer and Montana State Game Warden presence should discourage this activity.

In this alternative, much of the wetland restoration project proposed by the Refuge and the NRCS is located in the area closed to big game hunting. Restoration activities may have an increased chance of success with limited access and less human disturbance.

Deer and elk hunting is an important tradition to a large number of Montanans. Many out-of-state hunters also converge on the State in the fall seeking the opportunity to bag a worthy deer or elk. This alternative maximizes big game hunting by providing for; the longest possible season allowed by State law and, liberal harvest opportunities (by allowing rifle as well as bow and arrow hunting).

Spring and fall turkey hunting would be allowed under this alternative. Turkeys are not indigenous to Montana. They were released by the MFWP to increase hunting opportunities. The fall turkey season runs from September 1 to December 15. Hunting of turkey is not considered detrimental to the biological integrity of the Refuge, is not likely to create conflict with other public uses and is within the wildlife dependent public uses to be given priority consideration. Currently, Flathead County has a permit only season with a total of 300 either-sex permits issued for the fall of 2001. Since turkeys are not endemic to this area, they are not a priority species in Refuge management considerations. They are a popular game species though, and the public interest would best be served by allowing this activity on the Refuge. The only legal means of take for turkey on the Refuge would be shot-gun using non-toxic shot. This should decrease law enforcement conflicts. Although turkey hunters would be permitted in the closed are, they would not legally have the means (rifle or bow and arrow) for harvesting big game. Spring turkey season runs from the first week in April to the first week in May. A total of 200 permits were issued in 2001 by MFWP for spring turkey hunting in Flathead County. Spring turkey hunting may cause minimal disturbance to nesting migratory birds. However, spring green-up is late in Pleasant Valley and many species may not have initiated nesting before the end of the spring turkey season.

Mountain grouse hunting is open on the Refuge in this alternative. Although the state of Montana allows grouse to be taken with shotgun, bow and arrow, rifle or handgun, grouse hunting on the Refuge will be limited to shotguns only, utilizing non-toxic shot. This will increase safety and reduce law enforcement conflicts. Since grouse season runs from September 1 to December 15, grouse hunters can hunt in the closed area during big game season. Grouse hunters will not be allowed to possess a rifle, bow, handgun or shotgun slugs anywhere on the Refuge including the closed area. Grouse populations in northwestern Montana are healthy (MFWP) though nest

success can fluctuate greatly with climatic conditions. No surveys have been conducted to evaluate grouse populations on the Refuge. However, approximately 50% of all mountain grouse harvested in Montana are taken in MFWP Region 1 (where Lost Trail is located). Refuge purposes do not include these species of resident game birds. Fall hunting of mountain grouse will not have a significant impact on the Refuge's migratory bird purpose as nearly all production will have occurred before the season opens. Hunting of mountain grouse is consistent with FWS policy on providing compatible hunting opportunities, especially given their lack of viewing opportunities, non-priority status, healthy population level, and being resident game.

The hunting of all other species is prohibited under this alternative. This will minimize disturbance to wildlife, habitat and other priority uses. The rationale for closing the Refuge to the hunting of other species is the same as in Alternative A.

This alternative would provide an abundance of hunting opportunities while still providing for other public uses and minimum disturbance to those species for which the Refuge was created (waterfowl and other migratory birds). There would also be minimum impact to wildlife by maximizing hunting opportunities in the fall season. This alternative does allow for a spring turkey season which could result in minimal disturbance to nesting birds, or fawning of deer and calving of elk. The level of disturbance would be directly related to the number of spring turkey hunters.

Rationale and impacts - Alternative C - Maximum Allowable Hunting

This alternative follows MFWP hunting regulations and seasons with minimum changes. It would allow for the maximum use of the Refuge by hunters, but would not provide "a quality hunt superior to that on other public and private lands" as required in the FWS policy. Crowded or firing line hunter conditions could arise for big-game and waterfowl hunting depending on game populations and behavior and the popularity of the Refuge. Staff resources and funds may not be sufficient to develop, operate, and maintain the hunt program to satisfy the high quality standards. With close cooperation and coordination with MFWP, this alternative may be possible.

An advantage of maximum allowable hunting may be that game species would be dispersed off the Refuge minimizing the chance of big game populations increasing beyond habitat restraints. However, this is not seen to be an issue. The small size of the Refuge coupled with moderate to heavy hunting pressure outside the Refuge boundary would probably keep populations within carrying capacity even with minimum hunting on the Refuge.

At present, waterfowl hunting opportunities on the Refuge are limited due to a low population of waterfowl using the Refuge in the fall, and the early freeze of Dahl Lake and valley ponds. Wetland restoration and enhancement is planned for much of the bottom lands of the Refuge. Wetland habitat restoration may increase waterfowl production and the number of waterfowl using the Refuge in the fall for staging, resting and migration thus potentially increasing

waterfowl harvest opportunities.

There will be much greater disturbance to wildlife in this alternative than in any of the other five alternatives. There would be some form of hunting on the Refuge most of the year, (Table 2). This may decrease the success of ground nesting birds and even inhibit nest establishment resulting in a loss of diversity. Under the enabling legislation, the Refuge was established as an "inviolate sanctuary, or for any other management purpose, for migratory birds" (16 USC 715-715d, 715e, 715f-715r). As such, no more than 40% of the refuge can be opened to migratory bird hunting. However, the 40% opened to hunting could contain 100% of the migratory bird habitat and still comply with the law. It also imposes no limits on hunting non-migratory birds or other species. The disturbance from year-round hunting would negatively affect migratory birds on the Refuge.

Finally, this alternative would have a much greater potential to conflict with other wildlife-dependent public uses of the Refuge. Wildlife would be hazed from the Refuge decreasing the opportunity for wildlife viewing and photography of many species, especially those with limited populations on the Refuge (e.g., moose, bear, wolf, waterfowl, etc.).

This alternative does not comply with the FWS biological integrity policy. Nearly unlimited hunting opportunities would materially interfere with the Refuge purpose of restoring migratory bird populations and restoring or maintaining a biological balance of predators and prey involving wild ungulates and gray wolves, and predatory birds and their prey such as waterfowl and small mammals. Funding and staff resources are not available at this time to adequately administer an exhaustive hunting program.

Rationale and Impacts - Alternative D - Special Permit Hunting

By limiting the number of hunters, this alternative provides for a quality hunt for big-game hunters as well as people with disabilities. It should also encourage ethical behavior due to the accountability built into a permit system. It allows for enough hunting pressure to prevent elk and deer from congregating on the Refuge during hunting season which will allow for greater opportunities for harvest off the Refuge. This alternative would likely cause less overall conflict with other priority wildlife-dependent public uses or with Refuge operations. The limited number of hunters allowed in this alternative decreases disturbance to wildlife, which will encourage wildlife use of the Refuge and contribute to better wildlife viewing and photography opportunities.

This alternative may require more resources, including additional staff time, law enforcement, and funding to administer than all other alternatives except Alternative C (Maximum Allowable Hunting). Therefore, MFWP collaboration, coordination and assistance would be required to conduct the hunt.

Mountain grouse hunting with shotgun only and utilizing non-toxic shotshells will be open on

the Refuge. Grouse populations in northwestern Montana are healthy even though nest success fluctuates greatly due to climatic conditions. No surveys have been conducted to evaluate grouse populations on the Refuge. However, approximately 50% of all mountain grouse harvested in Montana are taken in MFWP Region 1 of 7 regions. Refuge purposes do not include these species of resident game birds. Fall hunting of mountain grouse will not have a significant impact on the Refuge's migratory bird purpose since nearly all production will have occurred before the season opens. Hunting of mountain grouse is consistent with FWS policy on providing compatible hunting opportunities especially given their lack of viewing opportunities, non-priority status, healthy population level and being resident game.

This alternative would also bias the permits toward local hunters and against those hunters unable to make the drawing. It would also greatly limit the number of hunters that would have an opportunity to hunt on the Refuge.

This alternative may provide a high quality hunt with a high degree of safety and low disturbance to other wildlife species, Refuge operations and other public uses.

The rationale for closing the Refuge to the hunting of other species is the same as in Alternative A.

Rationale and Impacts - Alternative E - MFWP

This alternative was developed from comments received from MFWP during the internal review of the draft EA. Some of these comments were incorporated into Alternatives A and B. Alternative E is now similar to Alternative B with the exception of minor changes to mountain grouse and turkey hunting and the inclusion of waterfowl and furbearer hunting. Deer and elk hunting would be the same as Alternative B allowing for rifle and archery hunting following MFWP regulations and seasons in designated areas of the Refuge. As in Alternative B, the first week of archery and the first week of general season would be reserved for youth only.

Turkey and grouse hunting would be permitted over the entire Refuge including the area closed to big game hunting and means of take would include shotgun, bow and arrow, rifle and handgun. This could increase law enforcement needs by allowing archery equipment and rifles in the area closed to big game hunting. The presence of hunters in this area with rifles and shotguns may also defeat the purpose of a closed area by increasing disturbance to wildlife and other public users.

Furbearer hunting would be allowed following MFWP seasons and regulations using rifle or shotgun with non-toxic shot. MFWP hunting regulations stipulate "Bobcat and wolverine are the only animals defined by law as furbearing animals that may be taken by hunting (MCA 87-2-601)". Montana state bobcat and wolverine hunting seasons are open from December 1 through February 15. The Refuge is a wintering area for a herd of up to 200 elk. Allowing furbearing

hunting would extend the hunting season on the Refuge into the winter months which may cause disturbance to wintering deer and elk. Wolverine and bobcat hunting could also conflict with

other priority public uses by extending the hunting season and associated disturbance. Wolverine and bobcat are rare on the Refuge. Hunting may reduce the number of individuals on the Refuge even further reducing diversity which would negatively impact the biological integrity of the Refuge.

This alternative would open up to 40% of the Refuge to waterfowl hunting. At present, waterfowl hunting opportunities on the Refuge are limited due to a low population of waterfowl using the Refuge in the fall, and the early freeze of Dahl Lake and valley ponds. However, wetland restoration and enhancement is planned for much of the bottom lands of the Refuge. Wetland habitat restoration should increase waterfowl production and potentially the number of waterfowl using the refuge in the fall for staging, resting and migration.

This alternative provides for a wide variety of hunting opportunities for a diversity of constituents. There would be some form of hunting on the Refuge for seven months of the year.

This alternative does not comply with the FWS biological integrity policy. Though this alternative proposes significantly less hunting than does the Maximum Hunting Alternative it would nevertheless materially interfere with the refuge purpose of restoring migratory bird populations. Funding and staff resources are not available at this time to adequately administer an exhaustive hunting program.

Rationale and Impacts - Alternative F - No Action

This alternative would provide more wildlife viewing and photographic opportunities to the public. There may be less disturbance to wildlife and fewer user conflicts than in the other alternatives. This alternative would also require the least amount of time and money to administer by the FWS.

Deer and elk may seek shelter on the Refuge during the hunting season. This would limit the hunting opportunities for areas surrounding the Refuge and could lead to an increase in herd size past the carrying capacity of the Refuge. This alternative would limit recreational opportunities for hunters but there are abundant opportunities for hunting on private, state and federal lands in the vicinity of the Refuge.

Hunting is an appropriate wildlife dependent public use on Refuges as provided in the Refuge Improvement Act of 1997 so long as it is determined compatible with refuge purposes and other priority public uses. Limited hunting opportunities are believed to be appropriate and compatible. This alternative would not meet FWS policy to allow hunting on National Wildlife

Refuges, if compatible.

ENVIRONMENTAL CONSEQUENCES

Game mammals, migratory birds, resident game birds, biological diversity and wildlife oriented recreation environmental consequences on the Refuge have been addressed in the rationale and impacts sections. There should no significant adverse impact on other environmental factors such as wildlife and habitat on a regional level, water quality, water quantity, air quality, social, or economic factors with the implementation of any of the proposed alternatives. Lost Trail National Wildlife Refuge consists of 7,885 acres. The Pleasant Valley area where the Refuge is located is already one of the most heavily hunted areas in northwest Montana. This is due to its proximity to the cities of Kalispell and Libby, an abundance of federal, state, and private land open to hunting, and a high density of roads in the area. Total hunting pressure for the Pleasant Valley area should change very little whether the Refuge remains closed or is completely opened to hunting.

Endangered Species

The two threatened species known to inhabit the Refuge are the bald eagle and gray wolf. Other threatened species such as the grizzly bear and Canada lynx are known to be present in the area but are not documented on the Refuge.

Bald eagles have traditionally nested in the aspens along Dahl Lake. Unfortunately the nest blew out of the tree in the summer of 2000. The eagles have been seen in the same area at the time of this assessment. Although a new nest has been constructed, renesting has not been documented. In a study of human disturbance effects on bald eagles, Steidl and Anthony (1999) found that human activity near bald eagle nests caused "clear and consistent changes in behaviors of breeding eagles" which could adversely affect nesting and reproductive success. Alternatives A, B, D, E and F should have no significant impact on bald eagles on the Refuge. Alternative F allows no hunting. In Alternatives A, B, D and E provide for fall hunting only with the exception of spring turkey. A no hunting buffer area will be designated for eagle nest areas prior to and during the nesting season. Since nearly all hunting would occur during the fall no significant disturbance from mid-winter through fledging is anticipated. Alternative C could have the most significant impact on nesting eagles since it provides year round hunting opportunities.

Gray wolves have denned within 1/4 mile of the Refuge boundary. In 1989, there were 3 adults and 3 pups in the pack. Unfortunately they started to prey on livestock and were removed from the area. A second pack formed in 1996 and had pups in 1997 and 1998. Once again they preyed on livestock and were removed in 1999. There is not a pack in the immediate vicinity of the Refuge at this time but lone individuals have been observed. An indirect impact to wolves from hunting would be a reduction in the prey base. Alternative C (Maximum Allowable Hunting) would have the most impact and Alternative F (No Hunting) may have the least impact.

Direct impacts would be in the form of human/wolf contact and minimal reduction of prey individuals. Disturbance is directly related to the number of hunters on the Refuge and would again be the highest for Alternative C and the least for Alternative F. Alternatives D,B,A and E, respectively, would have potential impact on wolf use of the refuge in direct relationship to the number of days hunting would be allowed. There would be no significant negative impact on wolves from Alternative F unless it resulted in increased non-hunting public visitation causing increased human/wolf contacts. Federal law and Refuge policy dictate that National Wildlife Refuges should be secure areas for endangered species. If necessary hunting on the Refuge under any of the alternatives would be restricted or suspended to protect an endangered species.

Environmental Justice

Executive Order 12898 of February, 1994 entitled, "Federal Action to Address Environmental Justice in Minority and Low Income Populations," requires Federal agencies to take action to the extent practicable and permitted by law, to make achieving environmental justice part of its mission by identifying and addressing as appropriate disproportionately high and adverse human health effects of its programs and policies and activities on minority population and low-income populations. This assessment has not identified any adverse or beneficial effects unique to minority or low-income populations in the affected area.

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Acknowledgments

We would like to thank the following individuals for their assistance in obtaining background information for this Environmental Assessment.

Lydia Bailey, Montana Department of Fish Wildlife and Parks
Jerry Brown, Montana Department of Fish Wildlife and Parks
Jim Williams, Montana Department of Fish Wildlife and Parks

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